

67,036-003; B05541-AT1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Beneditz  
Serial Number: 10/060,043  
Filed: 1/29/2002  
Group Art Unit: 2836  
Examiner: Rios Cuevas, Roberto Jose  
Title: POWER DISTRIBUTION ASSEMBLY  
WITH REDUNDANT ARCHITECTURE

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER RULE 1.131**

I, Kerrie A. Laba, state as follows:

1) I am a patent attorney, at all times representing the Applicant in this application, and responsible for its preparation and filing.

2) I have reviewed the disclosure documents and correspondence with the client concerning this application in preparing this Declaration.

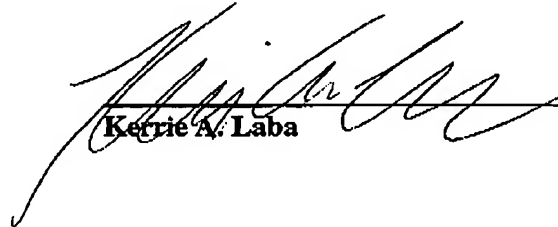
3) The invention disclosure was prepared by the inventors on a date before the effective 35 U.S.C. 102(c) date of Heckmann, which is April 3, 2000. Exhibit A attached to this Declaration is a copy of an invention disclosure document that was completed prior to April 2000. The signature page is page 7 of the document, and each of the inventors has signed the disclosure. Dates on the signature pages and the dates on drawings included in the disclosure form have been redacted, but I have looked at these dates and all of the dates are prior to April 2000.

Additional work was done on the invention and a decision was made to have the concept searched in May 2001. Exhibit B attached to this Declaration is a copy of page 1 of a search report letter pertaining to the subject invention. In light of the search results, a decision was made to prepare and file a patent application. Diligence was maintained throughout the preparation and filing of the application. The subject application was filed on January 29, 2002.

67,036-003; B05541-AT1

4) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: July 23, 2004



Kerrie A. Laba

DOCKET NO. ~~718-1174~~

(Patent Dept. will supply)

SUNDSTRAND

INVENTION DISCLOSURE 67036-

003

**TITLE** (Be descriptive and specific): Secondary Power Distribution Assembly (SPDA) electrical architecture that provides for redundancy, flexibility, expandability and minimizes single point failure modes.

**INVENTOR(S)** (Include middle name or initial):

<b>INVENTOR NAME:</b>	Bruce D. Beneditz	<b>CITIZENSHIP:</b>	US
<b>ADDRESS:</b>	5548 Rural Edge Drive Roscoe, IL 61073	<b>DEPT:</b>	716
		<b>WORK PHONE:</b>	394-3310
<b>INVENTOR NAME:</b>	Russell G. Stoneback	<b>CITIZENSHIP:</b>	US
<b>ADDRESS:</b>	1157 Griggs Rd. Rockford, IL 61108	<b>DEPT:</b>	760
		<b>WORK PHONE:</b>	394-3393
<b>INVENTOR NAME:</b>	Marc A. Bouton	<b>CITIZENSHIP:</b>	US
<b>ADDRESS:</b>	5906 Covey Ridge Tr. Loves Park, IL 61111	<b>DEPT:</b>	760
		<b>WORK PHONE:</b>	394-3414
<b>INVENTOR NAME:</b>	Ken Spear	<b>CITIZENSHIP:</b>	US
<b>ADDRESS:</b>	Rockford, IL 61108	<b>DEPT:</b>	760
		<b>WORK PHONE:</b>	394-5611
<b>INVENTOR NAME:</b>	John A. Dickey, PE	<b>CITIZENSHIP:</b>	US
<b>ADDRESS:</b>	1080 Hall Rd. Malabar, FL 32950	<b>DEPT:</b>	718
		<b>WORK PHONE:</b>	394-2766

**PROBLEM** (Describe the environment and motivation for the invention, being as specific as possible. Include specific projects, if any.):

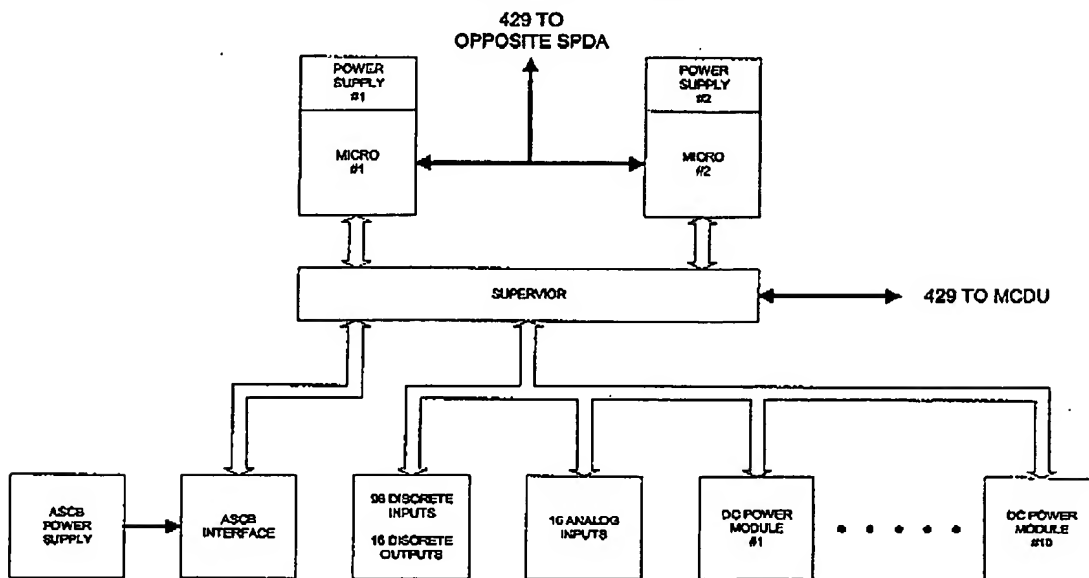
The problem with the electrical architecture used in the current family of Secondary Power Distribution Assemblies, SPDAs, is that it does not provide the flexibility and processing throughput to meet the needs of future applications. In addition, the architecture requires a significant redesign when other aircraft communication options need to be addressed. The goal is to provide a family of modules and chassis that can be applied to different applications without the need for hardware and packaging redesigns. The Invention Disclosure written by Bob Cooney in [REDACTED] and assigned the Docket No. B05531-AT1-USA addresses the mechanical packaging of an SPDA to allow for flexibility, expansion and reapplication. This disclosure addresses an electrical architecture that fits within that mechanical framework. Some of the specific problems that are address:

1. Single point failures of the supervisory logic (arbitrates between the redundant microprocessors).
2. Single point failures in the back plane of the SPDA.
3. In ability of the processors to monitor each other's health and report problems.
4. In ability to provide for input/output expansion via "slave" SPDAs. The slave SPDAs have no processing power, but are controlled by the master SPDA.
5. The bus structure and processor speed of the current approach can not support today's high-speed aircraft data busses.

EXHIBIT A

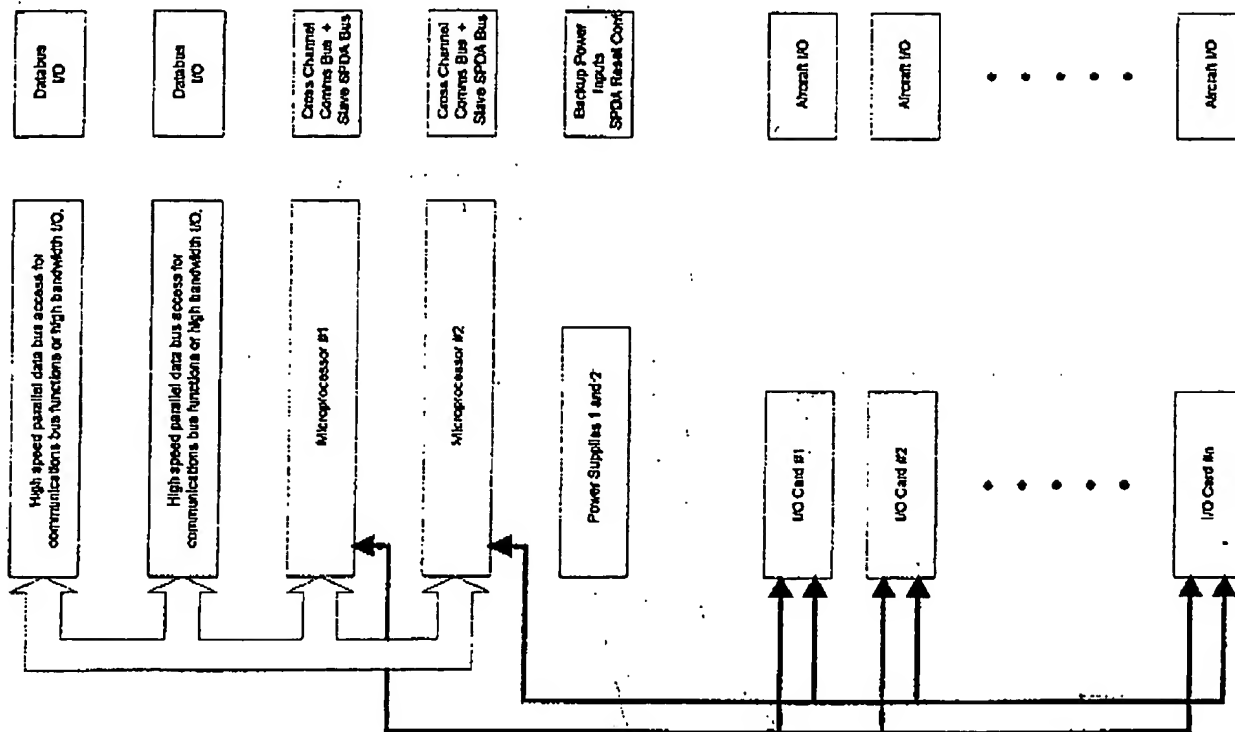
Old SPDA Approach

# SIMPLIFIED SPDA BLOCK DIAGRAM CURRENT APPROACH



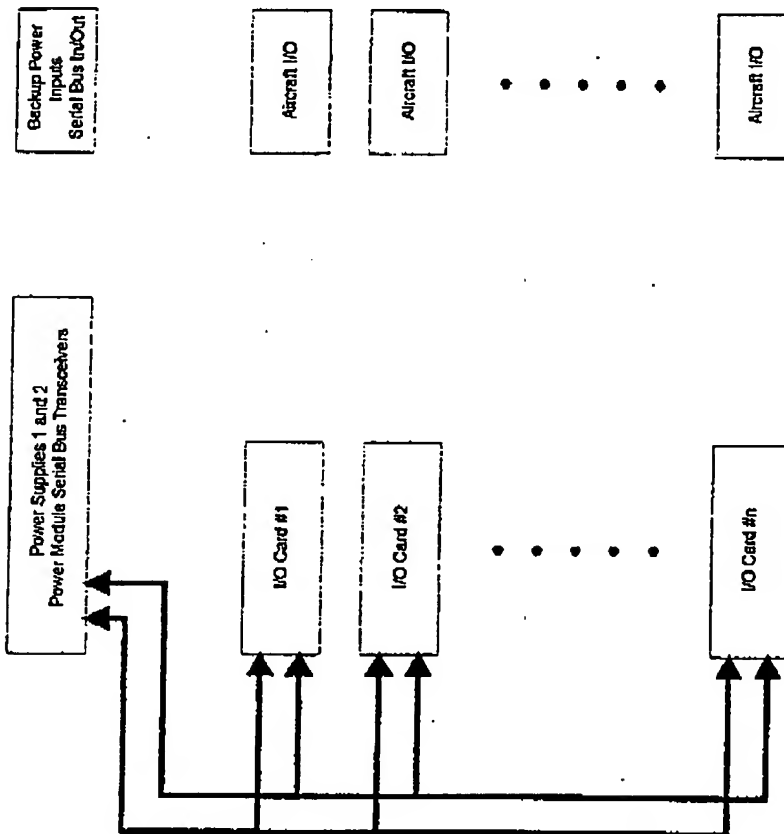
B. BENEDICTZ

## MASTER SPDA CONNECTOR LAYOUT PROPOSED APPROACH



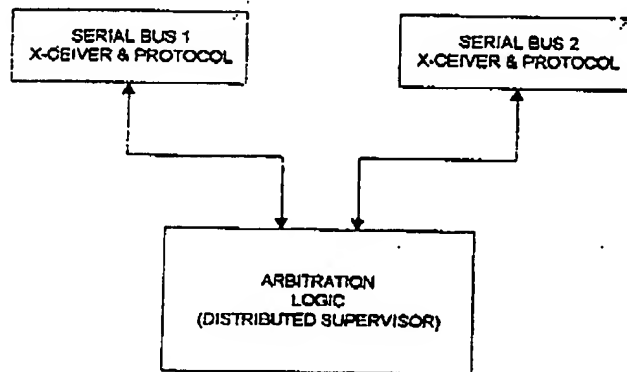
B. BENEDITZ  
-000000

# SLAVE SPDA CONNECTOR LAYOUT PROPOSED APPROACH



B. BENEDITZ

## DISTRIBUTED "SUPERVISOR" FUNCTION PROPOSED APPROACH



- \* Functions similar to current supervisor.
- \* Transmit data and receive data from active micro.
- \* Transmit data only to standby micro.
- \* Active micro is the one that is providing command data.
- \* If both micros providing command data then default to micro 1.
- \* Provide status of off channel communications for BIT.

B. BENEDITZ





**ANSWERS TO THE FOLLOWING QUESTIONS ARE REQUIRED FOR PROCESSING THE APPLICATION.  
PROVIDE COMPLETE DATES (i.e., MONTH/DAY/YEAR) FOR ALL "YES" ANSWERS BELOW.**

	YES	NO	DATE
1a. Has a model or prototype been built?		<input checked="" type="checkbox"/>	
b. Has a model or prototype been tested?		<input checked="" type="checkbox"/>	
c. If so, was it tested outside of a Sundstrand (or division) facility?		<input checked="" type="checkbox"/>	
2a. Was the invention made under government contract?		<input checked="" type="checkbox"/>	
If so, contract number			
b. Was the invention made under a joint development contract?		<input checked="" type="checkbox"/>	
If so, identify the parties			
3. Is the invention related to a license agreement?		<input checked="" type="checkbox"/>	
If so, identify the parties			
4a. Has the invention been orally described, shown, demonstrated or exhibited to non-Sundstrand (or division) employees?		<input checked="" type="checkbox"/>	
If so, to whom?			
b. Has the invention been shown or described to a potential customer or supplier?		<input checked="" type="checkbox"/>	
If so, to whom?			
c. Has the invention been described in a proposal?		<input checked="" type="checkbox"/>	
If so, proposal number			
customer			
d. Has the invention been advertised or described in any publication other than a proposal?		<input checked="" type="checkbox"/>	
If so, where?			
e. Has the invention been shipped?		<input checked="" type="checkbox"/>	
If so, to whom?			
5. If any event listed under item 4 or 1c above will probably occur in the future, identify the event(s) and estimated date(s):			
We may wish to apply the invention to the current Fairchild 728JET program. The invention will be proposed to Embraer for proposal support in the near future.			
6. Are you aware of any proprietary information agreements relating to the above items?		<input checked="" type="checkbox"/>	
If so, identify parties			

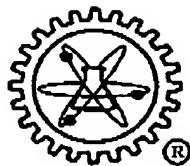
**Please answer the following questions if known (Attach additional sheets if required):**

I. Who are the primary customers (e.g., Boeing, Airbus, DOW, etc.)?	Any vehicle power distribution system. This would include any Sundstrand customer.
II. What products presently incorporate the invention (777, compressor, pump, etc.)?	None
III. What future applications will the invention likely to be used in?	Any vehicle where integrated power distribution boxes are used.
IV. What area of technology is the invention related to (pumps, VF, controller, etc.)?	Electric Power Distribution
V. What is the assembly, model, and/or part number where the invention is or will be used?	
VI. What is the division/enterprise where the inventor(s) is located?	Sundstrand Aviation/Electric Power Business Unit

**SIGNATURES:**

Inventor:	<u>Bruce D. Bennett</u>	Today's Date	<u>[Signature]</u>
Inventor:	<u>John A. Driskell, PE</u>	Today's Date	<u>[Signature]</u>
Inventor:	<u>Furness M. Stinebaugh</u>	Today's Date	<u>[Signature]</u>
Inventor:	<u>Mark A. Boudreau</u>	Today's Date	<u>[Signature]</u>
Inventor:		Today's Date	
Witnessed and understood by:	<u>Leland E. Weber</u>	Today's Date	<u>[Signature]</u>
Print Name:	<u>Leland E. Weber</u>		
Witnessed and understood by:	<u>John Buzzard</u>	Today's Date	<u>[Signature]</u>
Print Name:	<u>JOHN BUZZARD</u>		

KLW 4/14/98

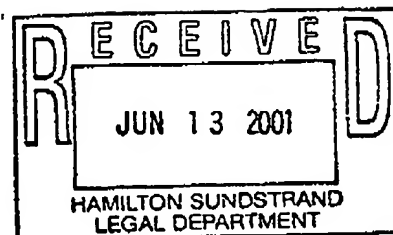


## EXPRESS SEARCH, INC.

2121 Eisenhower Ave., Suite 500 Alexandria, VA 22314  
Phone: (703) 535-5455 • Fax: (703) 535-5475

*Patent and Trademark Services*  
*www.ExpressSearch.com*

HAMILTON SUNDSTRAND  
4747 Harrison Avenue  
Rockford, IL 61108



Re: Patent Novelty Search  
B05541-AT1-USA

Secondary Power Distribution Assembly Electrical Architecture that Provides for Redundancy, Flexibility, Expandability and Minimizes Single Point Failure Modes

June 11, 2001

Dear Mr. Mican,

In accordance with your letter of May 23, 2001, received May 30, 2001, a Patent Novelty Search of 12 hours was conducted at the U.S. Patent and Trademark Office for a means to provide a highly reliable integrated secondary power distribution system for application in aircraft and other vehicle electric power distribution systems, in accordance with the disclosure provided.

A manual search was conducted. Examiner Paladini, in Art Unit 2841, was consulted regarding the field of search. The following classes and subclasses were searched:

- Class 307 (Electrical Transmission or Interconnection Systems)
  - Subs. 9.1, 18, 64, 125, 29, 17, 87, 38, 35, 66, 43
- Class 700 (Data Processing: Generic Control Systems or Specific Applications)
  - Subs. 9, 296, 297, 293, 295
- Class 363 (Electric Power Conversion Systems)
  - Subs. 37, 17, 65, 78
- Class 323 (Electricity: Power Supply or Regulation Systems)
  - Subs. 235, 283
- Class 361 (Electricity: Electrical Systems and Devices)
  - Subs. 63
- Class 713 (Electrical Computers and Digital Processing Systems: Support)
  - Subs. 300

**EXHIBIT B**